101201
SHAUGHNESSEY NO.

REVIEW NO.

EEB BRANCH REVIEW

DATE: IN 2/5/82 OUT 2/18/82

FILE OR REG. NO. 239-2404

PETITION OR EXP. PERMIT NO.

DATE OF SUBMISSION 1/18/82

DATE RECEIVED BY HED 2/4/82

RD REQUESTED COMPLETION DATE 5/25/82

EEB ESTIMATED COMPLETION DATE

RD ACTION CODE/TYPE OF REVIEW 400/ Data Submission

TYPE PRODUCT(S): I, D, H, F, N, R, S Insecticide

DATA ACCESSION NO(S).

PRODUCT MANAGER NO. M. Mautz (16)

PRODUCT NAME(S) Monitor 4 Spray

COMPANY NAME Chevron Chemical Company

SUBMISSION PURPOSE Submission of Bobwhite Quail Dietary LC50 Data

SHAUGHNESSEY NO.	CHEMICAL, & FORMULATION	% A.I.

DATA EVALUATION RECORD

1. Chemical: Monitor 4 Spray

2. Formulation:

   Monitor Technical Formula #605500
   Batch #9030005 74%

3. Citation

   Eight-day dietary -LC_{50}-
   Bobwhite Quail Technical
   Monitor
   WI - 447
   Wildlife International Ltd.
   October 5, 1979

4. Reviewed by: Wayne C. Faatz, Ph.D.
   Wildlife Biologist

5. Date Reviewed: 18 February 1982

6. Test Type: Avian dietary - 8 day

   Species: Bobwhite Quail

7. Reported Results:

   The acute LC_{50} technical Monitor in the Bobwhite Quail is 42 ppm, confidence limits 34 ppm to 52 ppm.

   The mortality is given in table I.

   Table I - Mortality Table

Control	Dead/No. in group	% dead
0	0/10	0 *(2)
Positive Control (Dieldrin)		
ppm		
15.9	1/10	10
25.1	3/10	30 *(8)
39.8	3/10	30
63.1	10/10	10
100.0	10/10	10

   LC_{50} is 35 ppm CI(95%) 28-44 ppm

Monitor		
ppm		
5.62	0/10	0
10.00	0/10	0 *(1)
17.80	0/10	0
31.60	2/10	20
56.20	8/10	80

The data marked with an * are the numbers used in the probit analysis. The data in the parentheses are the actual mortalities. The difference between these figures are deaths attributed to aggressive toe and nostral picking among the birds, but not toxicant related.

Signs of toxicity in the positive control and technical material were lethargy, depression, reduced reduction to external stimuli (sound and movement), wing droop, a ruffled appearance, loss of coordination, lower limb weakness, prostrate posture, loss of righting reflex, and convulsions.

8. Reviewers Conclusions:

The study is scientifically sound and satisfies the requirements for an upland game bird dietary test. However EEB does disagree with the calculation of the LC_{50}. (See Reviewers Evaluation Section).

Material and Methods

Bobwhite quail eggs were collected from Wildlife International Ltd.'s production flock and placed in a Humidaire Incubator (Model No. 500) for incubation. On Day 19 of incubation, the eggs were transferred to a Humidaire Hatcher (Model No. 50) and allowed to hatch on Day 21 or 23 of incubation.

Throughout incubation the temperature was maintained at 99.5°F ± 0.25°F with a wet bulb humidity index of 87.0°F ± 3.0°F. The incubator was equipped with automatic egg rotation, assuring that each egg was rotated from 45° off of vertical in one direction to 45° off of vertical in the oppossite direction (total arc of rotation was 90°) each hour through Day 19 of incubation. When the eggs were transferred to the hatcher, rotation was discontinued, the temperature was lowered to 99.0°F ± 0.25°F, and the wet bulb humidity index was increased to 94.0°F ± 1.0°F.

Hatchlings were placed in Beacon (Model B755) battery brooders until they were 14 Days of age. Battery brooder temperature was maintained at 100°F from the day of hatch through completion of the eight-day study.

From hatching through Day 13 of brooding, all chicks received a water soluble vitamin mix via their water (see attached analysis). Throughout the following eht-day study, the chicks received plain tap water.

The chicks received no form of antibiotic medication during brooding or throughout the eight-day study.

During brooding and throughout the eight-day study, the basal diet was Wildlife International Ltd.'s game bird starter ration (diet analysis attached). Starter ration and water were available ad libitum throughout the study.

The photoperiod throughout brooding and the eight-day study was fourteen hours of light per day.

At 14 days of age, the birds were randomly assigned to the treatment groups outlined below without regard to sex.

Treatment	Pens	Birds/Pen	Dietary Concentration (ppm)
Control	5	10	Basal Diet Only
Lab Standard	5	10	15.9, 25.1, 39.8, 63.1, & 100
Experimental	5	10	5.62, 10.0, 17.8, 31.6, & 56.2

The experimental material and dieldrin were dissolved in corn oil in concentrations such that the addition of two parts (by weight) of each solution to 98 parts of the standard game bird starter ration resulted in the logarithmic series of dosage levels outlined above. For the purposes of diet preparation, the experimental material was assumed to be 100 percent active material and the LC_{50}, as reported, is therefore of the experimental material as received.

The birds were exposed to the appropriate dietary concentrations for five days, and then maintained on toxicant-free diet for additional three-day observation period. The control birds received the basal diet throughout the study.

Body weights were recorded by pen at initiation and termination of study. Feed consumption was recorded by pen during the five-day exposure period. Feed consumption was measured accurately, but is presented as an estimate due to the unavoidable wastage by the birds.

Symptoms of toxicity and mortality were recorde daily throughout the study. Mortality was analyzed statistically by probit analysis. A discussion of the methods of statistical analysis is provided in the attachment entitled, "Statistical Methods."

Reviewers Evaluation

A. Test Procedure: The test procedures are acceptable.

B. Statistical analysis:

The probit analysis is an acceptable statiscal procedure for this type of data.

C. Discussion/Results

The contractor eliminated bird mortality due to nasal and toe picking from the calculations of the LC_{50} data. These deaths were considered not to be dose related.

4

On this point EEB disagrees in general. The elimination of some of the mortality data is quite discretionary on the part of the researcher. The possibility does exist that behavioral modification could very well indeed be toxicant related. The test procedure does not address this specific aspect. Since the mortality cannot be disproved as being dose related safety consideration dictate that the mortality is a result of the toxicant and/or husbandry practices.

In this particular case the LC_{50} calculated by EEB using total mortality did not change appreciably from that submitted by the contractor (See attached calculations). For this reason the test is considered acceptable.

D. Conclusions

1. Category: Core

2. Rationale: N/A

3. Repairability: None

5

WAYNE MONITOR QUAIL ACUTE DIETARY LC50

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
56.2	10	8	80	5.46875
31.6	10	2	20	5.46875
17.8	10	0	0	0.09765625
10	10	1	10	1.074219
5.62	10	0	0	0.09765625

THE BINOMIAL TEST SHOWS THAT 17.8 AND +INFINITY CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 42.14167

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
2	0.2148829	42.14167	33.40961	62.21316

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
6	0.351817	1	0.06910682

SLOPE = 3.43221
95 PERCENT CONFIDENCE LIMITS = 1.396423 AND 5.467997

LC50 = 41.87923
95 PERCENT CONFIDENCE LIMITS = 30.27782 AND 78.67653

LC10 = 17.86384
95 PERCENT CONFIDENCE LIMITS = 6.787618 AND 25.3236

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WAYNE MONITOR QUAIL. ACUTE ORAL LC 50 LABORATORY STANDARDDIELDRIN
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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
100	10	10	100	0.09765625
63.1	10	10	100	0.09765625
39.8	10	3	30	17.1875
25.1	10	8	80	5.46875
15.9	10	1	10	1.074219

THE BINOMIAL TEST SHOWS THAT 15.9 AND 63.1 CAN BE
USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 27.38935

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	0.1682306	28.77303	22.30348	35.73524

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
9	3.399978	5.207138	0.0013557

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED
USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 3.666938
95 PERCENT CONFIDENCE LIMITS =-3.09454 AND 10.42841

LC50 = 27.99457
95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

LC10 = 12.6106
95 PERCENT CONFIDENCE LIMITS = 0 AND 34.08199
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7